CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM R7-2019-0013

FOR

COUNTY OF SAN BERNARDINO, SOLID WASTE MANAGEMENT DIVISION
OWNER/OPERATOR
LANDERS SANITARY LANDFILL
CLASS III LANDFILL, CLASS II SURFACE IMPOUNDMENTS,
AND CORRECTIVE ACTION

Southeast of Landers, San Bernardino County

CONSISTS OF FOUR PARTS:

PART I – SAMPLING AND ANALYSIS GENERAL REQUIREMENTS
PART II – SITE-SPECIFIC MONITORING REQUIREMENTS
PART III – EVALUATION OF MONITORING DATA
PART IV – REPORTS TO BE FILED WITH THE REGIONAL WATER BOARD

This monitoring and reporting program (MRP) is issued pursuant to Water Code section 13267 and incorporates requirements for groundwater and unsaturated zone detection monitoring, special monitoring provisions relating to individual waste management units, evaluation monitoring, and corrective action monitoring. Monitoring requirements in this MRP are necessary to determine if Landers Sanitary Landfill (Facility) is in compliance with Waste Discharge Requirements Order R7-2019-0013 (Order) and to ensure early detection of any releases of waste constituents from the Facility. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) or its Executive Officer.

PART I

SAMPLING AND ANALYSIS GENERAL REQUIREMENTS

A. SAMPLE COLLECTION AND ANALYSIS PLAN

1. As provided in Section I.3 of the Order, the Discharger shall submit a Sample Collection and Analysis Plan (SCAP) that incorporates the standard monitoring provisions below and describes the sampling and analysis protocols to be used for all monitoring activities, including for the groundwater and vadose zone detection, evaluation, and corrective action programs at the Facility. The SCAP shall also incorporate procedures for drying, testing, and disposal of septage wastes obtained from the surface impoundment IMP-2, which were formerly described in a separate Septage Management Plan. The SCAP must be received by the Regional Water Board **within 90 days** of adoption of the Order and this MRP.

2. Once the SCAP is approved, the Discharger may request changes to the approved SCAP, as needed, but shall use the procedures described in the approved SCAP until such changes are authorized by the Regional Water Board's Executive Officer.

B. STANDARD MONITORING PROVISIONS

1. **Analytical Methods.** Specific methods of analysis for monitored waste constituents shall be identified in the SCAP. If the Discharger proposes to use methods other than those in the latest edition of the U.S. Environmental Protection Agency's (USEPA) *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium* (SW-846) or *Guidelines Establishing Test Procedures for Analysis of Pollutants* (40 C.F.R. part 136), the SCAP must explain the rationale for the change. The change must be approved by the Regional Water Board prior to use.

2. **Monitoring Test Procedures.** The collection, preservation, and holding times of all samples shall be in accordance with protocols included in USEPA's SW-846 or 40 C.F.R. part 136, or as otherwise approved by the Regional Water Board. The Regional Water Board may, in its discretion, require methods more sensitive than those specified by USEPA.

3. **30-Day Sample Procurement Limitation.** For any given monitored medium, the samples collected from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be collected within a span not to exceed 30 days, unless a longer time period is approved by the Regional Water Board's Executive Officer, and shall be collected in a manner that ensures sample independence to the greatest extent feasible.

4. **Laboratory Certification.** Unless otherwise approved by the Regional Water Board's Executive Officer, all analyses shall be conducted by a laboratory certified by the State Water Resources Control Board (State Water Board), Division of Drinking Water's Environmental Laboratory Accreditation Program (ELAP).

5. **Reporting Levels.** All analytical data shall be reported with method detection limits (MDLs) and with either the reporting level or limits of quantitation (LOQs) according to 40 Code of Federal Regulations part 136, Appendix B. The laboratory reporting limit for all reported monitoring data shall be no greater than the practical quantitation limit (PQL).

6. **QA/QC Data.** All quality control / quality assurance (QA/QC) data shall be reported, along with the sample results to which they apply, including the method, equipment, and analytical detection limits, the recovery rates, an explanation of any recovery rate that is less than 80%, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analyses, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recovery. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged, but the analytical results shall not be adjusted.

7. **Instrumentation and Calibration.** All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated, as necessary, to ensure their continued accuracy. If continuous monitoring equipment is out of service for a period greater than 24 hours, the Discharger shall obtain representative grab samples each day the equipment is out of service. The Discharger shall correct the cause(s) of failure of the continuous monitoring equipment as soon as practicable. The Discharger shall report the period(s) during which the equipment was out of service and if the problem has not been corrected, shall identify the steps which the Discharger is taking or proposes to take to bring the equipment back into service and the schedule for these actions.

8. **Field Test Instruments.** Field test instruments (such as those used to test pH, dissolved oxygen, and electrical conductivity) may be used provided that:

    a. The user is trained in proper use and maintenance of the instruments;

    b. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency;

c. The instruments are field-calibrated prior to monitoring events at the frequency recommended by the manufacturer; and

d. Field calibration reports are submitted.

9. Records Retention. The Discharger shall maintain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports required by the Order and this MRP throughout the life of the Facility, including the post-closure maintenance period. Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. The individual(s) who performed the sampling, and/or measurements;

c. The methods used for groundwater purging/sampling;

d. The date(s) analyses were performed;

e. The individual(s) who performed the analyses;

f. The analytical techniques or method used; and

g. All sampling and analytical results, including:

i. units of measurement used;

ii. minimum reporting limit for the analyses;

iii. results less than the reporting limit but above the method detection limit (MDL);

iv. data qualifiers and a description of the qualifiers;

v. quality control test results (and a written copy of the laboratory quality assurance plan);

vi. dilution factors, if used; and

vii. sample matrix type.

PART II

SITE-SPECIFIC MONITORING REQUIREMENTS

This part describes the site-specific monitoring program requirements to be implemented for the Facility and is organized by the type of monitoring to be performed. The methods used shall be as described in the approved SCAP.

The site-specific monitoring program of this MRP includes:

Section	Monitoring Program
A	Groundwater Monitoring
B	Unsaturated Zone Monitoring
C	Surface Water Monitoring
D	Special WMU Monitoring – Surface Impoundment IMP-2
E	Special WMU Monitoring – Landfill LF-2
F	Evaluation Monitoring
G	Corrective Action Monitoring

A. GROUNDWATER MONITORING

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of California Code of Regulations, title 27, sections 20415 and 20420. Monitoring shall be performed in accordance with the locations, frequencies, and parameters described below:

1. Monitoring Well Locations

a. As described in the WDRs starting at Finding 50, the groundwater is divided into three zones based on differences in the chemistry of the water:

1) a northern zone,
2) a central zone that has higher sulfate concentrations; and
3) a southwestern zone that has high TDS, chloride, and nitrate concentrations associated with a release from IMP-1.

In addition, groundwater elevation differences indicate that groundwater flow directions and gradients are complex, and the wells have been grouped together based on a combination of chemistry and elevation, as follows:

4) a northern group where groundwater appears to flow to the east (but does not include the location of former wells L3 or L-10);

5) a southern group where groundwater appears to flow to the southeast; and
6) an eastern group located east of the Reche groundwater barrier where flow direction is uncertain but water levels are hundreds of feet lower than west of the barrier.

Note that well L-9 is not included in any of these groups because it appears to be isolated.

b. Upgradient wells are considered background monitoring points. Downgradient wells where no releases have been detected are used for detection monitoring. Downgradient wells where releases have been detected are part of corrective action (Corr. Action) monitoring. The groundwater monitoring network shall consist of the following monitoring wells and any new monitoring wells added at the Facility (as approved by the Regional Water Board's Executive Officer):

Well	Chem. Zone	Elev. Group	WMUs	Monitored Status	Frequency
L-1	Southwestern	Southern	LF-2A, IMP-1	Corr. Action	Quarterly
L-6	Southwestern	Southern	LF-1, IMP-1	Corr. Action	Quarterly
L-7	Southwestern	Southern	LF-1, IMP-1	Corr. Action	Quarterly
L-8	Central	Northern	LF-2A	Corr. Action	Quarterly
L-9	Southwestern	Isolated	IMP-1	Corr. Action	Quarterly
L-13	Northern	Eastern	LF-2A	Corr. Action	Quarterly
L-16	Southwestern	Southern	IMP-1	Corr. Action	Annually
L-17	Northern	Northern	Background	Detection	Annually
L-18	Northern	Northern	Background	Detection	Annually
L-19	Northern	Northern	Background	Detection	Annually
L-20	Central	Eastern	LF-2A	Corr. Action	Quarterly
L-21	Northern	Eastern	LF-2A	Corr. Action	Quarterly
L-22	Central	Southern	LF-2A, IMP-2	Detection	Quarterly

Corr. Action refers to wells that contain COCs released from a WMU.

Groundwater gradients and flow directions shall be calculated using wells from the same elevation group. Isolated wells, including wells L-9 and former wells L-3 and L-10, shall not be used to evaluate groundwater gradients or flow directions, nor shall gradients be shown to cross the locations of these isolated wells.

c. **Groundwater Monitoring Wells Workplan.** As provided in Section 1.5 of the Order, the Discharger is required to submit a workplan for the installation of additional groundwater monitoring wells within **120 days** of adoption of the Order.

2. Monitoring Parameters

a. Field Monitoring Parameters – During each groundwater monitoring event, the following field parameters shall be measured:

Parameter	Unit

pH	pH units
Groundwater elevation	feet above sea level (USGS Datum)
Specific Conductance	Micromhos/cm
Temperature	^{o}F
Turbidity	NTU
Dissolved Oxygen	mg/L and Percent Saturation
Oxidation-Reduction Potential (ORP)	(mV)

b. Routine Monitoring Parameters – Four times per year (quarterly), groundwater samples shall be analyzed at a laboratory for the following constituents (at a minimum):

Constituents	Unit	Sample Type	Reporting Frequency
pH	pH units	Grab	Quarterly
Total Dissolved Solids	mg/L	Grab	Quarterly
Chloride	mg/L	Grab	Quarterly
Sulfate	mg/L	Grab	Quarterly
Bicarbonate (HCO3)	mg/L	Grab	Quarterly
Major Cations (calcium, potassium, magnesium, and sodium)	mg/L	Grab	Quarterly
Nitrate (as N)	mg/L	Grab	Quarterly
Nitrite (as N)	mg/L	Grab	Quarterly
Chemical Oxygen Demand (COD)	mg/L	Grab	Quarterly
Biological Oxygen Demand (BOD)	mg/L	Grab	Quarterly
Volatile Organic Compounds (EPA Method 8260)	ug/L	Grab	Quarterly

c. COC Monitoring Parameters – In addition to the routine monitoring parameters listed above, the groundwater shall be analyzed at a laboratory every five years, with the next monitoring event to be performed in the fall of 2020, and alternating between fall and spring of each five-year reporting period thereafter, for the following constituents of concern (COCs) (and any additional COCs required by the Regional Water Board's Executive Officer):

Carbonate (CO_3)
Total Alkalinity
Fluoride
Phosphate
Iron
Manganese
17 Heavy Metals
40 CFR, Appendix II Pesticides
40 CFR, Appendix II Herbicides
40 CFR, Appendix II Semi Volatiles
Phenols (EPA Method 8270)
Cyanide

B. UNSATURATED ZONE MONITORING

The Discharger shall operate and maintain an unsaturated/vadose zone detection monitoring system that complies with the applicable provisions of California Code of Regulations, title 27, sections 20415 and 20420. Unsaturated zone monitoring at the Facility includes both soil pore liquid monitoring and soil pore gas (soil-gas) monitoring around the landfill areas, and a soil moisture monitoring system around IMP-2.

As provided in Section I.7 of the Order, the Discharger is required to submit an **Unsaturated Zone Monitoring Workplan** for LF-2B within **90 days** of adoption of the Order.

1. Soil Pore Liquid Monitoring at LF-2

a. Three piezometers located around LF-2, identified as LPW-1, L-12 and L-15, shall be monitored quarterly for the presence of water. All are presently in detection monitoring.

b. If an accumulation of moisture is present in one or more of the piezometers, samples shall be collected (without purging) and analyzed for the Field Monitoring Parameters Routine Monitoring Parameters and COC Monitoring Parameters the first time a sample is collected, and for the Field Monitoring Parameters and Routine Monitoring Parameters on all subsequent events.

c. If insufficient liquid is collected to analyze the entire analyte list, laboratory testing shall be performed preferentially as follows:

i. VOCs
ii. TDS, nitrates, nitrites, and ammonia
iii. Remainder of Routine Monitoring Parameters list
iv. Remainder of COC list

2. Soil-Gas Monitoring

a. The Discharger shall monitor the vadose zone perimeter monitoring system quarterly in accordance with the most-recently approved version of the site-specific SCAP. The Discharger shall use a field screening protocol for soil-gas monitoring. A calibrated field instrument, such as a Landtec GEM 500 or equivalent, shall be used to measure total organic compounds as methane at each of the monitoring probes.

b. If a field measurement of 5% by volume or greater methane is detected, a soil-gas sample shall be collected in accordance with procedures described in the SCAP and submitted for laboratory analysis of VOCs using EPA Method TO-15, and methane, oxygen and carbon dioxide using ASTM D1946. Nitrogen shall be calculated and reported as the balance of the gases.

3. Soil Moisture Monitoring at IMP-2

a. The Discharger shall monitor the moisture probes around IMP-2 each quarter using the most recently-approved version of the SCAP.

b. Tables of the results in monitoring reports shall be as percent moisture and include all of the moisture data obtained to-date at these features. A description of the methods used to derive the values shall be included. Any correction factors applied to the data shall be based on a site-specific calibration event performed at the site, and a description of the calibration method and results shall be included in each quarterly report.

c. Moisture percent values that are 3 percent higher than the average moisture content for that location and depth shall be considered indications of a possible release. Response actions to be performed if a possible release is identified are described in Part II.F.

d. **IMP-2 Moisture Monitoring Workplan.** As provided in Section I.6 of the Order, the Discharger is required to submit a workplan regarding the moisture monitoring program for IMP-2 within **90 days** of the adoption of the Order.

C. SURFACE WATER MONITORING

Perennial streams are not located at the Facility and the occurrence of surface water should be limited to (1) immediately after significant storm events, and (2) if seeps develop along the perimeter of a waste management unit.

1. **Observed Surface Water Monitoring.** If surface water is observed at the Facility, the source of the surface water shall be identified, and observations of the following shall be included in the next quarterly monitoring report:

    a. Flow rate and source of water;
    b. Floating and suspended materials of waste origin: Presence or absence, source, and size of affected area;
    c. Discoloration and turbidity: Description of color, source, and size of affected area;
    d. Evidence of odors: Presence or absence, characterization, source, and distance of travel from source; and
    e. Weather conditions: Wind direction and estimated velocity, total precipitation during the previous five (5) days and on the day of observation.

2. **Storm Water Monitoring.** After each significant storm event, the remaining freeboard (in vertical feet) and storage capacity (in gallons and/or acre-feet) of each stormwater retention basin shall be identified. If the remaining storage capacity of a stormwater retention basin drops below the volume needed to retain a 100-year storm event, the Discharger shall take steps to remove water from the stormwater basin until the remaining capacity is at least enough to hold a 100-year storm event. Any storm water-related actions shall be reported in the next quarterly report.

3. **Seep Monitoring.** If a seep is identified in proximity to any of the waste management units:

    a. The location, flow rate and other characteristics (such as color and odor) shall be orally reported to the Regional Water Board within 48 hours, and a written report

concerning the seep shall be submitted to the Regional Water Board within 7 days.

b. Flow from the seep shall be contained to preclude the seep from adversely affecting surface waters.
c. A sample of the seepage shall be collected and tested for the Field Monitoring Parameters described in Part II.A.2.a.
d. If the Field Monitoring Parameters indicate the seepage is not groundwater, or the discharger concludes that it is unlikely the source of the seep is groundwater, the sample shall be analyzed for the Routine Monitoring Parameters and COC Monitoring Parameters described in Part II.A.2.b and c.
e. The results of all testing shall be reported to the Regional Water Board within 7 days of receipt of the written laboratory report.

D. SPECIAL WMU MONITORING – SURFACE IMPOUNDMENT IMP-2

1. Waste Capacity Monitoring

a. The following shall be monitored at least once per month and included in the quarterly monitoring report:

i. The water level and freeboard in each impoundment cell, and the available storage capacity of the impoundment cells.

ii. Observations of erosion, settlement and/or subsidence along the visible areas of the impoundment, including the top of the berm, outer slopes, and upper region of the inner slope. Repairs shall be performed as needed and documented in the inspection logs.

b. The following information regarding the waste discharged to the surface impoundment shall be monitored and included in the Facility monitoring reports:

Parameter	Unit	Reporting Frequency
1. Amount of septic waste discharged to ponds	Loads, Tons and Gallons	Quarterly
2. The amount of treated sludge Discharged to the landfill	Cubic Yards	Quarterly
3. The amount of sludge present In the Landfarm	Cubic Yards	Quarterly

2. Residual Solids of Treated Sludge Monitoring

a. Prior to disposal in LF-2A or LF-2B, the chemical constituents of the sludge obtained from IMP-2 and dried in the Landfarm area shall be tested in accordance with the most recently approved version of the SCAP. At a minimum, the dried sludge shall be tested for the following parameters:

Parameters and Constituents	Type of Unit	Reporting Sample	Frequency
VOCs	mg/kg	Composite	Quarterly
SVOCs	mg/kg	Composite	Quarterly
17 Heavy Metals[1]	mg/kg	Composite	Quarterly

b. The sludge monitoring results shall be reported to the Regional Water Board on a quarterly basis for any quarter in which dried sludge is disposed into either LF-2A or LF-2B.

3. LCRS Monitoring

a. Two LCRS systems are present at IMP-2 and shall be monitored on a weekly basis. The Discharger shall monitor the depth of liquid accumulated in each LCRS sump to an accuracy of one-quarter (¼) inch, record the data in the weekly monitoring logs, and include the data in the quarterly report.

b. If liquid is detected, the following actions are required:

   i. If less than two feet of liquid is present in the sumps, no further action is required.
   ii. If more than two feet of liquid is present, the liquid shall be evacuated to the extent practical and discharged into the associated pond. The amount of liquid evacuated shall be measured to the nearest gallon and recorded in the weekly monitoring logs. After evacuation, the height of liquid in the LCRS sump shall be measured again to an accuracy of one-quarter (¼) inch and recorded in the weekly monitoring logs.

c. The rate at which liquid accumulates in the LCRS sumps shall be calculated using the difference between the last reading obtained during one visit and the first reading obtained during the next visit and reported in gallons per day. The horizontal radius of the LCRS sumps at this Facility is 1.5 feet or about 53 gallons per foot of height in the sump. If the liquid extends higher in the LCRS sump than the connection point of the drainage pipe leading from the LCRS (about 3 feet), the volume of that drainage pipe shall be included in the calculation.

d. An accumulation rate that exceeds the allowable leakage rate (ALR) of 3 inches per day (about 13 gallons per day) shall be considered an indication of a possible leak. See Part II.F.3 for required actions when a possible leak is identified.

e. The Discharger shall test each LCRS annually pursuant to California Code of Regulations, title 27, section 20340(d) to demonstrate proper operation. Except for the first annual test, the results of this testing shall be compared to earlier tests made under comparable conditions.

[1] The 17 heavy metals are: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium and zinc.

E. SPECIAL WMU MONITORING – LANDFILL LF-2

1. Waste Monitoring

Incoming loads of waste shall be monitored, and the following information included in each quarterly report:

	Parameter	Unit	Reporting Frequency
1.	Solid waste discharged to Landfill	Cubic Yards	Quarterly
2.	Type of Materials discharged	----	Quarterly
3.	Remaining capacity of Landfill	Cubic Yards	Quarterly
4.	Any discharge of wastes other than those allowed by this Order	Type, volume and location	Immediately upon becoming aware that the waste has been discharged together with action for immediate correction and prevention of recurrence
5.	Hazardous waste load-checking and storage (not more than 90 days)	Cubic Yards	Quarterly

2. Leachate Monitoring LF-2B

a. LCRS systems do not currently exist at LF-2. As part of the construction of LF-2B, an LCRS sump will be installed within the footprint of LF-2B.

b. Once waste is placed into LF-2B, all LCRS sump(s) for LF-2B shall be inspected monthly for the presence of leachate. If liquid is found in a LCRS sump:

   i. The flow rate shall be measured at least monthly and reported in gallons per day;

   ii. The electrical conductivity and pH shall be measured in the field quarterly;

   iii. Samples of the leachate shall be collected annually and analyzed for the same Field and Routine Monitoring Parameters used for groundwater monitoring (including every 5 years for the COC Monitoring Parameters);

   iv. If a chemical is detected in the LF-2B LCRS leachate testing that is not part of the Routine Monitoring Parameters for the groundwater monitoring wells, it shall be added to the Routine Monitoring Parameters for groundwater monitoring; and,

c. The first time liquid is found in a LCRS sump:

   i. The Regional Water Board shall be notified verbally within 7 days; and

ii. A sample of the leachate shall be collected within 48 hours and analyzed for the Field Monitoring Parameters, Routine Monitoring Parameters and COC Monitoring Parameters used for groundwater monitoring.

d. The LCRS sump(s) shall be emptied, as needed. The removed liquid shall be disposed of in accordance with the requirements in the Order.

e. The Discharger shall test each LCRS annually pursuant to California Code of Regulations, title 27, section 20340(d) to demonstrate proper operation. Except for the first annual test, the results of this testing shall be compared to earlier tests made under comparable conditions.

F. EVALUATION MONITORING

1. Notification of a Release

Should the Discharger discover a release to groundwater from the Facility, the Discharger shall:

a. Notify the Regional Water Board by phone or e-mail within 24 hours, and by mail within seven days, when the Discharger determines from groundwater monitoring results that there is significant evidence of a release.

b. Notify the Regional Water Board by phone or e-mail within 30 days of a sampling event when the Discharger determines that there is preliminary indication of a release. The Discharger shall provide written notification by certified mail within seven days of the initial notification, and conduct a retest.

2. Evaluation of a Release

If the Discharger determines that a previously unknown release from the Landfill has occurred, the following actions shall be taken:

a. If this determination is not based upon direct monitoring of the COCs, then the Discharger shall, **within 30 days**, sample for all COCs at all monitoring wells in both the detection and corrective action groundwater monitoring networks and submit the samples for analysis. Within seven days of receiving the laboratory analytical results, the Discharger shall notify the Regional Water Board, by certified mail, of the concentrations of all COCs at each monitoring point sampled. Because this scan is not to be statistically tested against background, only a single datum is required for each COC at each monitoring well.

b. The Discharger shall, **within 90 days** of determining there is measurably significant evidence of a release, submit an Amended Report of Waste Discharge (ROWD) proposing an evaluation monitoring program that meets the requirements of California Code of Regulations, title 27, sections 20415(b)(2), 20420(k)(5), and 20425 et seq.

c. The Discharger shall, **within 180 days** of discovering the release, submit to the Regional Water Board a preliminary engineering feasibility study report that meets the requirements of California Code of Regulations, title 27, section 20420(k)(6).

3. Excessive Leachate Production at IMP-2

a. When a possible leak is identified by any of the monitoring systems and processes, the Discharger shall:

i. Report to the Regional Water Board by telephone within two days that a possible leak has been identified. A follow-up written report including the accumulation rate in each LCRS sump and current moisture probe data shall be submitted to the Regional Water Board within 7 days,

ii. The Discharger shall submit monthly status reports to the Regional Water Board documenting activities and monitoring results until the Regional Water Board indicates that status reports are no longer needed.

b. If a possible leak is identified because the liquid accumulation rate in an LCRS exceeds the ARL, samples shall be collected from: (i) the each LCRS sump with an accumulation rate higher than the ALR and (ii) the associated pond. These samples shall be analyzed for TDS, nitrates, nitrites and ammonia at a laboratory certified by the State Water Resources Control Board, Division of Drinking Water. The results of the laboratory testing shall be submitted to the Regional Water Board within 7 days of receipt.

Laboratory results shall be considered evidence of a probable leak if the TDS, nitrate, nitrite or ammonia concentrations from the LCRS sump(s) are within 50 percent of the concentrations in the associated impoundment cell(s).

If the TDS, nitrate, nitrite and ammonia concentrations in the LCRS sump(s) are less than 50 percent of the concentrations in the associated impoundment cell(s):

i. Continue monitoring the accumulation rate in the LCRS sump(s) on a weekly basis, including evacuation of the LCRS sump after monitoring, if warranted.

ii. If the leakage rate exceeds 100 gallons per day, install a pump in the LCRS sump to maintain the liquid level in the sump to a depth of 3 feet or less, and,

iii. Collect and analyze samples from the LCRS sump(s) and associated ponds for the same analytes listed above on a monthly basis.

Weekly monitoring and monthly sampling shall continue until the accumulation rate averages less than 3 inches per day for two consecutive readings. If the chemical concentrations in the LCRS sample increase to within 50 percent of the associated impoundment, this shall be considered evidence of a probable leak and the actions outlined in Part II.F.3.d shall be followed.

c. If a possible leak is identified due to high moisture contents in the soil moisture probes, the Discharger shall retest the soil moisture probes weekly and/or conduct other tests within 60 days to validate the reliability of the elevated soil moisture readings. If the soil moisture

readings are validated, the Discharger shall conclude the data indicates a probable release has occurred and shall follow the actions outlined in Part II.F.3.d.

d. When a probable leak is identified, the Discharger shall:

   i. Notify the Regional Water Board by telephone within 48 hours with a follow-up written report within 7 days,

   ii. Submit within 30 days for review and approval a workplan to investigate whether a leak has actually occurred. The workplan shall include a time schedule for performing the work. The results of any investigation shall be documented in a report submitted to the Regional Water Board. Status reports shall be submitted to the Regional Water Board monthly.

e. If a leak exceeding the ALR is confirmed to be present, the Discharger shall submit within 30 days for review and approval a workplan detailing the steps to be taken to repair the leak. The workplan shall include a time schedule for the repair to be completed. In addition, a pump shall be installed to maintain a liquid height of 3 feet or less in the affected LCRS sump until the repair is completed. The evacuated liquid may be returned to the either impoundment cell or disposed offsite.

G. CORRECTIVE ACTION MONITORING

The Discharger shall conduct corrective action monitoring to demonstrate the effectiveness of corrective action in accordance with California Code of Regulations, title 27, section 20430 and this MRP. Groundwater monitoring wells and unsaturated zone monitoring points that are in a corrective action monitoring program shall be monitored in accordance with the groundwater and unsaturated zone monitoring requirements in Parts II.A and II.B of this MRP.

Corrective Action EFS Workplan. As provided in Section H.3 of the Order, within **90 days** of the issuance of the Order, the Discharger is required to submit to the Regional Water Board for review and approval a workplan and time schedule for re-performing an Engineering Feasibility Study (Revised EFS) to evaluate the fate and transport of the pollutants detected in groundwater under the Facility using up-to-date data. The Revised EFS must evaluate remedial alternatives for both groundwater releases identified in Finding 38 of the Order. If “intrinsic remediation” continues to be the preferred alternative, the Revised EFS report shall contain: (1) predictions regarding the rate at which concentrations will decline; (2) data analysis methods for monitoring the rate of decline; and (3) thresholds for further action should that time frame be exceeded.

PART III

EVALUATION OF MONITORING DATA

Part III of this MRP provides the requirements for the analysis of detection and corrective action groundwater monitoring data collected from monitoring wells associated with the Facility. The objective of the detection groundwater monitoring program is to ensure early detection of a release of waste constituents from the Facility. To accomplish this objective, the detection groundwater monitoring program must be able to determine whether the release of a COC has created a measurably significant increase at any given monitoring point. Similarly, the objective of the corrective action groundwater monitoring program is to monitor the effectiveness of the remedial alternatives initiated and implemented by the Discharger to achieve compliance with the water quality protection standard adopted for the Facility. To achieve this objective, the Discharger must analyze groundwater samples collected from each corrective action monitoring well to determine which COCs are present and how their concentrations are changing over time.

A. DETECTION MODE MONITORING

If COCs have not been detected in groundwater samples collected from a given well, that well will be monitored in "detection mode."

Inter-well comparisons shall be used where upgradient and downgradient wells intercept the same aquifer and are expected to have similar concentrations of naturally-occurring constituents. The following wells may be evaluated using inter-well comparisons:

Background Wells	Downgradient Wells
L-17, L-18 and L-19	L-13 and L-21

Intra-well comparisons shall be used where uncontaminated background wells are not present, or the chemical composition of upgradient and downgradient wells are significantly different. Intra-well comparisons shall be used on all wells not listed above for inter-well comparisons.

The data used to calculate natural background concentrations shall exclude data from a monitoring event during which a release of naturally occurring chemicals appears to have been detected, as follows:

Wells	Rationale
L-1	Exclude data from monitoring episodes after December 2, 2004 because large increases in TDS, chloride, and nitrates suggest a plume of pollutants from IMP-1 reached L-1 shortly after that date.
L-6, L-7, L-9	Do not use data from these wells to evaluate background because high TDS, chloride, and nitrate concentrations in the first round of sampling indicate these wells were installed into an existing plume of

contamination from IMP-1. Use background data from L-1 from prior to December 2, 2004.

B. TRACKING MODE MONITORING

When one or more COCs are detected in groundwater samples and there is statistically significant evidence of a release, the Discharger shall monitor all COCs in that groundwater monitoring well in "tracking mode." In tracking mode, the Discharger shall analyze COC concentrations in groundwater by plotting the concentrations in groundwater samples collected from a given well over time. The graphical representation of the groundwater data will be used to track trends in COC concentrations over time, and assist in evaluating the impacts of COCs on groundwater quality. All corrective action monitoring wells shall be monitored in "tracking mode."

C. WATER QUALITY PROTECTION STANDARD

The Facility is in violation of its water quality protection standard (Water Standard) any time a constituent in a given groundwater well in "detection mode" exhibits a measurably significant increase (as defined by Cal. Code Regs., title 27, section 20164) over the applicable background data set. All groundwater wells monitored in "tracking mode" remain in violation of the Water Standard until completion of a successful proof period that ends the corrective action program. The Water Standard for the Facility consists of the following components:

1. Concentration Limits

a. **Default Limits.** The following concentration limits shall apply, unless the Regional Water Board approves a Concentration Limit Greater than Background (CLGB), as provided in Part III.C.1.b below:

i. **Non-natural Constituents.** For monitoring parameters and COCs that are not naturally occurring, the concentration limit shall be the detection limit of the laboratory testing procedure.

ii. **Naturally-Occurring Constituents.** For naturally-occurring monitoring parameters and COCs, the concentration limit shall be the background concentration determined through either inter-well or intra-well comparisons. The Discharger shall submit a report proposing applicable background concentrations.

b. **CLGB.** Use of a CLGB may be proposed by the Discharger provided it is justified through a statistical analysis of relevant data (including the background dataset) and a demonstration that background concentrations would not be technologically or economically feasible for the COCs for a given monitoring well. (Cal. Code Regs., tit. 27, § 20400, subd. (c).) A concentration limit greater than background will only be considered for COCs present in monitoring wells associated with corrective action monitoring. (Cal. Code Regs., tit. 27, § 20400, subd. (h)).

c. **Board Approval Required.** The Regional Water Board will review proposed concentration limits from the Discharger and approve, modify, or disapprove each proposed limit. (Cal. Code Regs., title 27, § 20400.)

2. Compliance Period

a. The compliance period for each waste management unit includes the active life of each waste management unit, the closure period, the post-closure maintenance period, and any compliance period under California Code of Regulations, title 27, section 20410.

3. Points of Compliance

a. All monitoring wells established for the detection monitoring program shall constitute the points of compliance for the Water Standard.

D. VALIDATION OF BACKROUND DATASETS

The Discharger may need to validate an intra-well background dataset for COCs at an existing well if there have not been enough sampling events at that well to create a background data set, and for each new well installed as part of the groundwater detection monitoring program. If the Discharger uses an intra-well approach, then the Discharger shall report the validated background dataset, specifying the COCs and monitoring well(s) affected, in the next scheduled monitoring report. If the Discharger detects COCs in monitoring wells while establishing the background dataset, then the Regional Water Board may determine that affected wells will become part of the corrective action monitoring program well network.

E. STATISTICAL METHODS

California Code of Regulations, title 27, section 20415(e) describes a range of statistical and non-statistical data analysis methods that can be used to evaluate data collected during monitoring. In addition, USEPA published *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (EPA 530/R-09-007) in 2009. The Discharger shall evaluate the data obtained during a monitoring period using either a statistical or non-statistical method described in title 27 or may propose another method for approval by the Regional Water Board's Executive Officer, as long as it achieves the goal of the monitoring program at least as well as the most appropriate method described in title 27, section 20415. Monitoring reports shall describe the statistical or non-statistical method used for each routine monitoring parameter and constituent of concern (COC) at each monitoring point and background monitoring point.

PART IV

REPORTS TO BE FILED WITH THE REGIONAL WATER BOARD

Part IV provides a description of the reports required to be submitted to the Regional Water Board for the Facility.

A. REQUIRED REPORTS

1. **Quarterly Monitoring Reports** – For each monitored medium, all monitoring results shall be reported quarterly. Quarterly Monitoring Reports shall include, at a minimum, the following:

   a. **Topographic Map.** A topographic map (or copy of an aerial photograph), at an appropriate scale, identifying the maximum lateral extent of wastes in the Facility, the locations of observation stations, monitoring points, background monitoring points, the groundwater elevation contours with interpreted groundwater flow direction and gradient.[2] Maps must also be updated to show the maximum extent of any waste constituent or waste degradation product in groundwater.

      The information contained on the topographic map shall also be provided in a Geographic Information System (GIS) shape file. The shape file must be polygons and include two Global Positioning Systems (GPS) points for each line of the polygon, with a minimum of 10 points. GIS metadata must also be submitted. The shape file and metadata shall be included on a CD attached to the report.

   b. **COC List.** A list of COCs for each detection and corrective action monitoring well/point.

   c. **Detection Limits.** Detection limits of laboratory testing and monitoring equipment.

   d. **COC Concentrations.** A table containing the concentrations of COCs in samples collected during the reporting period.

   e. **Groundwater Elevations.** The method and time of groundwater elevation measurements, a description of the method used to purge the well and collect groundwater samples, and quality assurance/quality control (QA/QC) procedures used.

   f. **Leachate Production.** The total volume of leachate collected each month during the monitoring period and the method of disposal of the leachate (i.e., reused at the Facility for dust control, sent offsite for treatment, etc.).

   g. **Field Logs.** Field logs used during well purging and sampling. At a minimum, the field logs should include the following:

[2] Evaluation of the groundwater gradient, flow direction and velocity shall be based on wells-pairs from the same elevation group, as described in Part II.A.1.

i. The well number;
ii. The sampling date and time;
iii. The method of monitoring field parameters and calibration of equipment used to monitor field parameters;
iv. The purge method (if a pump is used, include the depth of pump placement in each well and the pumping rate); and
v. The purge and sample collection information such as: date each well was purged; well recovery time; method of disposal of the purged water; an estimate of the volume of water purged from each well; the results of all field analyses; depth to groundwater prior to purging, at the conclusion of purging, and when the sample was collected; the method of measuring the water level; and field personnel names and signature.

h. Graphical Display. For each downgradient monitoring well and background monitoring well, a graphical display of all the groundwater data collected within at least the previous ten calendar years as required by California Code of Regulations, title 27, section 20415(e)(14). Each graph shall plot the concentration of one or more constituents on a semi-log scale, as appropriate. Based on visual inspection of trends, the Regional Water Board may direct the Discharger to carry out a preliminary investigation to determine whether a release is indicated.

i. Method of Analysis. Documentation of statistical and non-statistical data analysis at each monitoring well, for those COCs that have not previously been identified in a release at the well.

j. Summary of Groundwater Conditions. A written summary of the monitoring results and any changes to the groundwater monitoring system since the previous report. The written summary shall include a discussion of the groundwater flow rate and direction, the appearance of trends or other information that may indicate a potential change in the hydrogeologic conditions beneath and adjacent to the Facility.

k. Evaluation of Groundwater Data. An evaluation of the detection and corrective action· groundwater monitoring data analyzed according to the methods described in Part III of this MRP, and whether the analysis indicates a release of waste constituents or waste degradation products from the Facility.

l. Evaluation of Corrective Actions. A written summary that includes a discussion and evaluation of the effectiveness of corrective action measures implemented at the site to mitigate the release of waste constituents from the Facility.

m. Data Tables. All data obtained during the current reporting period and previous ten years presented in tabular form. Data files larger than 150 megabytes shall be provided electronically in a file format approved by the Regional Water Board. Any electronic files submitted to the Regional Water Board in accordance with Order No. R9-2019-0013 and this MRP, shall not be password protected.

n. Site Inspections. A copy of any site inspection report produced by the Discharger, the Local Enforcement Agency (LEA), or the Regional Water Board. Inspection reports may be included as an appendix to the quarterly report.

2. Annual Summary Report – The Discharger shall submit an annual report covering the period from January 1 through December 31 to the Regional Water Board, which shall include the following:

a. Sample Collection and Analysis Plan. The current version of the Sample Collection and Analysis Plan (SCAP).

b. Topographic Map. A topographic map (or copy of an aerial photograph), at an appropriate scale, identifying all the surface water and groundwater monitoring points, background monitoring points, the groundwater elevation contours with interpreted groundwater flow direction and gradient. Maps must also be updated to show the maximum extent of any waste constituent or waste degradation product in groundwater.

c. Summary of Groundwater Monitoring Data. A written summary of the groundwater monitoring results from both detection and corrective action monitoring wells, indicating any changes made or observed since the previous Annual Summary Report. Additionally, all analytical data obtained during the previous year shall be presented in tabular form. The data shall be provided electronically in a file format and media acceptable to the Regional Water Board.

d. Graphical Display. A graphical display for all data collected within at least the previous ten calendar years for each monitoring point and background monitoring point. Each graph shall plot the concentration of one or more constituents over time for a given monitoring point. For any given constituent, the scale for all plots should be the same to facilitate comparison and identification of trends. On the basis of any outliers noted in the plotted data, the Regional Water Board may direct the Discharger to carry out a preliminary investigation, in accordance with Part II.F of this MRP, to determine whether a release is indicated. Trend analyses shall include identification of current trends, a comparison to previously identified trends, and a discussion of any significant changes in the trends. This shall be prepared for groundwater and any vadose zone monitoring points (including subdrains, lysimeters, or landfill gas).

e. Background Concentration Limits Update. Reevaluate background concentration limits and propose any appropriate changes.

f. Leachate Data Summary. A summary of leachate data for each applicable waste management unit, consisting of the monthly total volume of leachate collected during the reporting year from the LCRS and any other leachate collection systems to demonstrate the effectiveness of the leachate collection and removal system. This summary shall contain a brief discussion of the leachate sampling results and volume produced and how the leachate was disposed of during the reporting period. This summary shall also include a table consisting of the last five years of leachate data collected at the Facility.

g. Sludge Wastes Data Summary. A summary of sludge waste data with a monthly tabulation of all sludge waste data collected during the reporting period, including the specific sources of sludge wastes, the weight (tons), and composition/types of sludge wastes discharged at the Facility. The summary shall also include a discussion that confirmation that the primary and secondary sludge wastes and mixtures primary / secondary sludges, and water treatment sludge, met the minimum moisture content and ratio of solids-to-liquids (by weight), required by the Order and title 27 of the California Code of Regulations. The summary shall also include a table that reports weight (tons) of sludge wastes discharged at the Facility.

h. Annual Waste Acceptance Summary. An annual tonnage summary consisting of the monthly total volume of wastes (in cubic yards), and weight (in tons) accepted at the Facility. The summary shall contain a table that lists each category of waste (i.e., MSW, sludge, contaminated soils, biosolids, etc.) and the volume accepted at the Facility each month during the reporting period. Further, the annual summary shall identify the source of non-MSW waste streams (i.e., sludges, sediments, biosolids, grit, etc.) discharged at the Facility during the reporting period.

i. Landfill Gas Data Summary. A landfill gas data summary consisting of all landfill gas data collected during the past year in accordance with the requirements set forth by CalRecycle and the LEA. This summary shall also contain a brief discussion of the findings and observations made during the past year regarding landfill gas production, migration, and/or any issues with the landfill gas monitoring system noted during the previous year.

j. Site Conditions Summary. Include a comprehensive discussion regarding the condition of the Facility, including, but not limited to, interim cover areas, the current operational area, maintenance roads, the erosion and drainage control measures implemented to control run-on and run-off during the rainy season, the condition of monitoring wells, piezometers, landfill gas probes, and any other monitoring device located at the Facility. The discussion should also highlight any areas of noncompliance observed and repaired during the previous year and should be documented with photographs and inspection reports.

k. Compliance Summary. Include a comprehensive discussion of the compliance record, and of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the Order or this MRP.

3. Five Year COC Reports – Every five years, the Discharger shall complete a COC analysis on groundwater samples to update and verify the COC list included in the Quarterly Monitoring Reports. The COC analysis shall include all COCs found in Appendix II of 40 Code of Federal Regulations part 258. The next COC Report shall be received no later than **2020** and shall be submitted as an appendix to any Quarterly Monitoring Report or Annual Summary Report having a reporting period that ends at the same time.

B. REPORT SCHEDULE

1. Quarterly monitoring reports shall be submitted to the Regional Water Board in accordance with the following schedule:

Monitoring Period	***Report Due***
January - March	May 15
April - June	August 15
July - September	November 15
October - December	February 15

2. Annual monitoring reports shall be submitted to the Regional Water Board by **February 15** of the following year.

3. Five-year reports shall be submitted to the Regional Water Board, commencing in the Fall of 2020 and every five years thereafter, in accordance with the following schedule:

Monitoring Period	***Report Due***
Spring	July 15
Fall	November 15

C. STANDARD REPORTING PROCEDURES

1. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.

2. In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to clearly illustrate whether the Facility is operating in compliance with the WDRs. Where appropriate, the Discharger shall include supporting calculations (e.g., for monthly averages).

3. The results of any analysis taken more frequently than required at the locations specified in this MRP shall be reported to the Regional Water Board.

4. As specified in Standard Provisions M.14, all monitoring reports shall be certified under penalty of perjury to be true and correct. Each report shall contain the following completed declaration:

   "I certify under the penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and

evaluated the information submitted. I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____day of _____ at _____

_____(Signature)

_____(Title)"

5. The monitoring reports and any other information requested by the Regional Water Board shall be signed by a principal executive officer or ranking elected official. A duly authorized representative of the Discharger may sign the documents if:

    a. The authorization is made in writing by the person described above;

    b. The authorization specified an individual or person having responsibility for the overall operation of the regulated disposal system; and

    c. The written authorization is submitted to the Regional Water Board's Executive Officer.

6. As specified in Standard Provisions M.13, technical reports shall be prepared by or under the direction of appropriately qualified professional(s). Each technical report submitted shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal.

7. As specified in Standard Provisions M.12, the Discharger shall comply with Electronic Submittal of Information (ESI) requirements by submitting all correspondence and reports required under this MRP and future revisions thereto, including groundwater monitoring data and discharge location data (latitude and longitude), correspondence, and monitoring reports to the State Water Board's Geotracker database. Documents that are 2.0 MB or larger should be broken down into smaller electronic files, labelled properly, and uploaded into Geotracker.

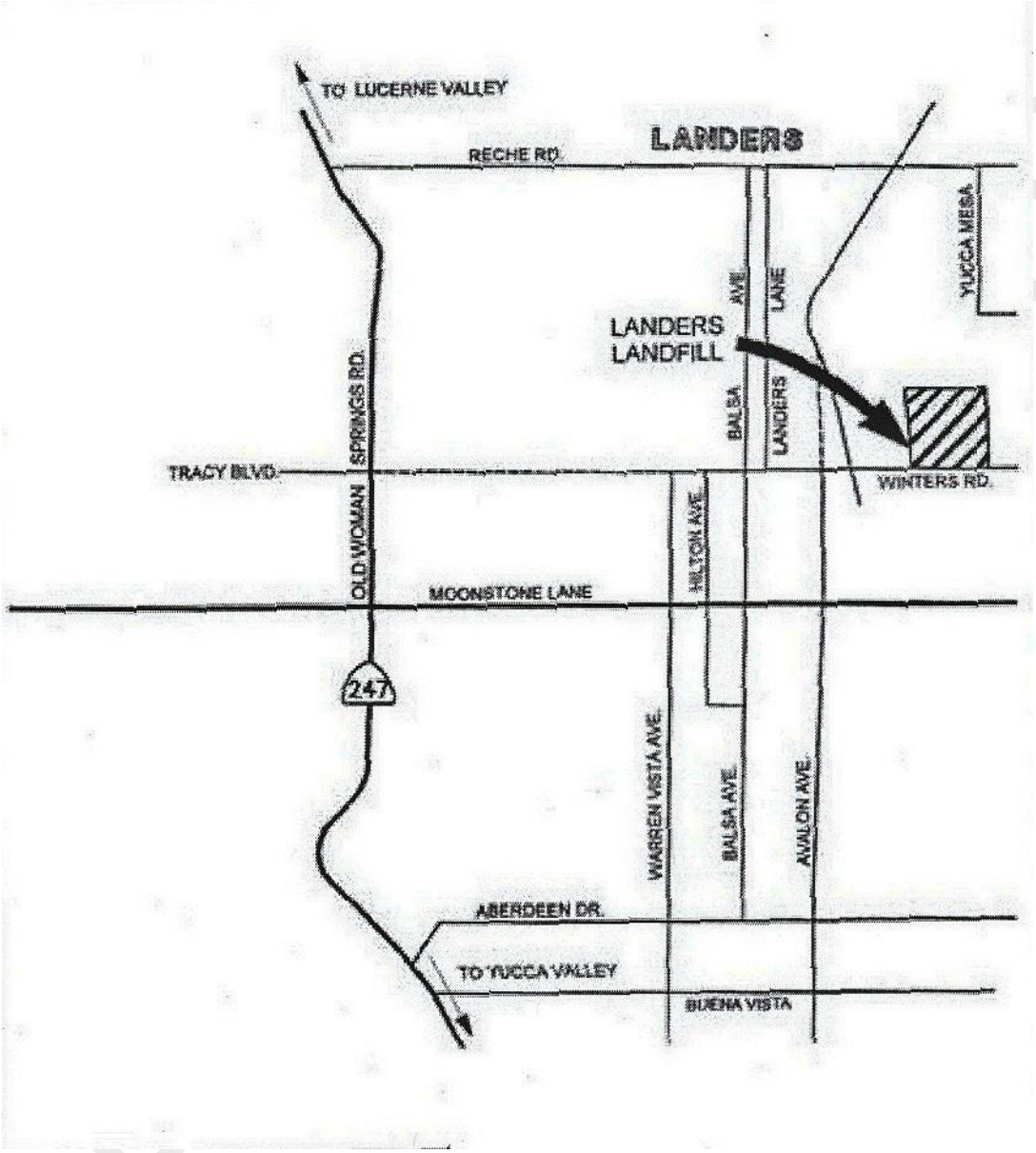
Ordered by: _____

Paula Rasmussen
Executive Officer

_____

Date

California Regional Water Quality Control Board
Colorado River Basin Region



Attachment A
Landers Sanitary Landfill – Site Location Map
County of San Bernardino, Solid Waste Management Division
San Bernardino County

Order R7-2019-0013